

What Is Claimed:

1. A system for detachably coupling a mixer drive to a mixer in a portable tank, the system comprising:

a portable tank having a mixer mounted in the tank, the mixer comprising a coupling having a first portion attached to a shaft for driving the mixer; and

a docking station adapted to receive the portable tank in an engaged configuration and to have no connection to the portable tank in a disengaged configuration, the docking station comprising a mixer drive having a second portion of the coupling for mating with the first portion.

2. The system of claim 1, wherein the mixer comprises a bottom-mount mixer.

3. The system of claim 1, wherein the coupling comprises a magnetic coupling.

4. The system of claim 1, wherein the docking station comprises a linkage for converting engagement motion transmitted by the tank in a first direction into engagement motion of the coupling second portion in a second direction.

5. The system of claim 4, wherein the wherein the docking station linkage comprises:

one or more linkage arms having the mixer drive pivotably attached at a first end of the one or more arms, a tank engagement member pivotably attached to an intermediate portion of the linkage arms, one or more biasing members pivotably attached at one end to the intermediate portion of the linkage arms and spaced apart from the tank engagement member for providing resistance to the engagement motion, the one or more biasing members having an opposite end pivotably attached to the support frame, and a slider assembly pivotably attached to a second end of the one or more arms, the linkage adapted to slide in the first direction along the slider assembly and to simultaneously rotate about an axis at or near the second end of the linkage to urge the first end of the linkage in the second direction toward the second

portion of the coupling during transition from the disengaged configuration to the engaged configuration.

6. The system of claim 5, wherein the docking station linkage comprises two arms having a plurality of pivot shafts connected between the arms, a mixer drive pivot shaft for pivotably attaching the mixer drive to the linkage arms, a tank engaging member pivot shaft for pivotably attaching the tank engaging member to the linkage arms, a biasing member pivot shaft for pivotably attaching the one or more biasing members to the linkage arms, and a slider assembly pivot shaft for pivotably attaching the slider assembly to the linkage arms, the pivot shaft comprising the axis about which the linkage arms rotate.

7. The system of claim 6, wherein the one of more biasing members comprises a pair of gas springs.

8. The system of claim 6, further comprising spring biasing members mounted on the mixer drive pivot shaft and the tank engaging member pivot shaft for providing spring resistance to pivotal motion of the mixer drive and the tank engaging member.

9. The system of claim 4, wherein in the engaged configuration the linkage is adapted to transmit a resultant downward force on the docking station and the tank comprises a member for receiving at least a portion of the resultant downward force.

10. The system of claim 9, wherein the docking station comprises a cantilevered structure.

11. The system of claim 1 further comprising a latch mechanism for preventing relative motion between the portable tank and the docking station with the system in the engaged configuration, the docking station comprising a first portion of the latch mechanism, the portable tank comprising a second portion of the latch mechanism for mating with the first portion, and the latch mechanism comprising a release mechanism for disengaging the latch mechanism.

12. The system of claim 11, wherein the first portion of the latch mechanism comprises a receiving port, the second portion of the latch mechanism comprises a tongue adapted to fit in the receiving port, and the release mechanism comprises a lever for lifting the tongue out of the receiving port.

13. The system of claim 12, wherein the latch comprises a latch assembly comprising a latch pivot shaft, a latch plate pivotably attached to the pivot shaft, the latch tongue at a first end of the latch plate, and the release lever at a second end of the latch plate, the latch plate connected to a biasing member that urges rotation of the latch plate about the pivot shaft in a direction that biases the latch tongue into the receiving port in the engaged configuration.

14. The system of claim 13, wherein the latch assembly further comprises a stop rod for limiting rotation of the latch plate as biased by the biasing member in the disengaged configuration.

15. The system of claim 1, wherein the portable tank comprises one or more components for facilitating engagement of the portable tank with the docking station.

16. The system of claim 15, wherein the one or more components comprises a pair of guide rails adapted to receive a portion of the docking station between the guide rails in the engaged configuration, the guide rails having a flared configuration relative to one another at a forward end of the guide rails to facilitate receipt of the portion of the docking station.

17. The system of claim 16, wherein the docking station comprises a bottom plate adapted in the engaged configuration to be positioned between the pair of guide rails, the bottom plate comprising a plurality of wheels for facilitating positioning of the bottom plate between the guide rails.

18. The system of claim 17 further comprising a wheel mounted on a shaft between the guide rails, the wheel positioned to contact an underside of the docking station bottom plate in the engaged configuration.

19. The system of claim 1 comprising a single docking station and a plurality of portable tanks.

20. A docking station component of a system for detachably coupling a mixer drive to a mixer in a portable tank, the system comprising a portable tank and a docking station adapted to receive the portable tank in an engaged configuration and to have no connection to the portable tank in a disengaged configuration, the portable tank comprising a mixer mounted in the tank, the mixer comprising a coupling having a first portion attached to a shaft for driving the mixer, the docking station comprising a mixer drive having a second portion of the coupling for mating with the first portion.

21. The docking station of claim 20 further comprising:

a support frame;

a linkage attached to the support frame for converting engagement motion transmitted by the tank in a first direction into engagement motion of the coupling second portion in a second direction; and

a first portion of a latch mechanism for preventing relative motion between the tank and the docking station with the system in the engaged configuration, the first portion adapted to mate with a second portion attached to the tank.

22. The docking station of claim 21, wherein the linkage comprises:

one or more linkage arms having the mixer drive pivotably attached at a first end of the one or more arms, a tank engagement member pivotably attached to an intermediate portion of the linkage arms, one or more biasing members pivotably attached at one end to the intermediate portion of the linkage arms and spaced apart from the tank engagement member for providing resistance to the engagement motion, the one or more biasing members having an opposite end pivotably attached to the support frame, and a slider assembly pivotably attached to a second end of the one or more arms, the linkage adapted to slide in the first direction along the slider assembly and to simultaneously rotate about an axis at or near the second end of the

linkage to urge the first end of the linkage in the second direction toward the second portion of the coupling.

23. The docking section of claim 22, wherein the linkage comprises two arms having a plurality of pivot shafts connected between the arms, a mixer drive pivot shaft for pivotably attaching the mixer drive to the linkage arms, a tank engaging member pivot shaft for pivotably attaching the tank engaging member to the linkage arms, a biasing member pivot shaft for pivotably attaching the one or more biasing members to the linkage arms, and a slider assembly pivot shaft for pivotably attaching the slider assembly to the linkage arms, the pivot shaft comprising the axis about which the linkage arms rotate.

24. The docking station of claim 23, wherein the one of more biasing members comprises a pair of gas springs.

25. The docking station of claim 23, further comprising spring biasing members mounted on mixer drive pivot shaft and the tank engaging member pivot shaft for providing spring resistance to pivotal motion of the mixer drive and the tank engaging member.

26. The docking station of claim 20, wherein the docking station comprises a cantilevered structure.

27. The docking station of claim 20, wherein the docking station comprises a bottom plate adapted in the engaged configuration to be positioned between guide rails on the portable tank, the bottom plate comprising a plurality of wheels for facilitating positioning of the bottom plate between the guide rails.

28. A tank guide component of a system for detachably coupling a mixer drive to a mixer in a portable tank, the system comprising a portable tank having a mixer mounted in the tank, the mixer comprising a coupling having a first portion attached to a shaft for driving the mixer and a docking station adapted to receive the portable tank in an engaged configuration and to have no connection to the portable tank in a disengaged configuration, the tank guide comprising:

a support frame for connection to the portable tank;

one or more components for facilitating and/or maintaining engagement of the portable tank with the docking station.

29. The tank guide of claim 28, wherein the one component for maintaining engagement with the docking station comprises a second portion of a latch mechanism for preventing relative motion between the tank guide and the docking station in the engaged configuration, the second portion adapted to mate with a first portion attached to the docking station.

30. The tank guide of claim 29, wherein the second portion of the latch mechanism comprises a tongue adapted to fit in a receiving port comprising the first portion of the latch mechanism, and the latch mechanism further comprises a release lever for lifting the tongue out of the receiving port.

31. The tank guide of claim 30, wherein the latch comprises a latch assembly comprising a latch pivot shaft attached to the tank guide frame, a latch plate pivotably attached to the pivot shaft, the latch tongue at a first end of the latch plate, and the release lever at a second end of the latch plate, the latch plate connected to the tank guide frame via a biasing member that urges rotation of the latch plate about the pivot shaft in a direction that biases the latch tongue into the receiving port in the engaged configuration.

32. The tank guide of claim 31, wherein the latch assembly further comprises a stop rod attached to the tank guide frame for limiting rotation of the latch plate as biased by the biasing member in the disengaged configuration.

33. The tank guide of claim 28, wherein one component for facilitating engagement of the portable tank with the docking station comprises a pair of guide rails adapted to receive a portion of the docking station between the guide rails in the engaged configuration, the guide rails having a flared configuration relative to one another at a forward end of the guide rails to facilitate receipt of the portion of the docking station.

34. The tank guide of claim 33, further comprising a wheel mounted on a shaft between the guide rails, the wheel positioned to contact an underside of the portion of the docking station adapted to be received between the guide rails.

35. The tank guide of claim 34, wherein the wheel positioned to contact with the underside of docking station is adapted to receive at least a portion of a resultant downward force transmitted by the docking station in the engaged configuration.

36. A batch manufacturing process for manufacturing a composition, the process comprising:

(a) providing one or more portable tanks, each tank having a mixer mounted in the tank, each mixer comprising a coupling having a first portion attached to a shaft for driving the mixer;

(b) providing at least one docking station adapted to receive the one or more portable tanks in an engaged configuration and to have no connection to the portable tank in a disengaged configuration, the docking station comprising a mixer drive having a second portion of the coupling for mating with the first portion;

(c) manufacturing a batch of the composition or an intermediate ingredient required for making the composition in each of the portable tanks, comprising performing one or more mixing steps by moving the portable tank to and engaging the tank with the docking station, connecting the first and second portions of the mixer coupling together, and driving the mixer in the portable tank using the mixer drive on the docking station.

37. The process of claim 36, wherein engaging the tank with the docking station comprises moving the tank in a first direction in contact with a portion of a linkage in the docking station such that the linkage converts the tank motion into engagement motion of the coupling second portion in a second direction to connect with the first portion of the coupling.

38. The process of claim 36, comprising providing each tank with a bottom-mount mixer and providing a magnetic coupling for the mixer drive and the mixer.

39. The process of claim 36, comprising providing a latch mechanism for preventing relative motion between the tank and the docking station in the

engaged configuration, the docking station comprising a first portion of the latch mechanism, and each portable tank comprising a second portion of the latch mechanism for mating with the first portion, the process comprising in step (c), engaging the latch mechanism to maintain engagement of the tank with the docking station, and after step (c) disengaging the latch mechanism by operating a latch release mechanism.

40. A portable tank having a mixer mounted in the tank, the mixer comprising a coupling having a first portion attached to a shaft for driving the mixer, the tank adapted for docking with a docking station in an engaged configuration and to have no connection to the docking station in a disengaged configuration, the docking station comprising a mixer drive comprising a second portion of the coupling that mates with the first part of the coupling, the portable tank comprising one or more components for facilitating and/or maintaining engagement of portable tank with the docking station.

41. The portable tank of claim 40, wherein one component for maintaining engagement of the portable tank with the docking station comprises a second portion of a latch mechanism for preventing relative motion between the tank and the docking station with the system in the engaged configuration, the second portion adapted to mate with a first portion attached to the docking station.

42. The portable tank of claim 41, wherein the second portion of the latch mechanism comprises a tongue adapted to fit in a receiving port comprising the first portion of the latch mechanism, and the latch mechanism further comprises a release lever for lifting the tongue out of the receiving port.

43. The portable tank of claim 41, wherein the latch comprises a latch assembly comprising a latch pivot shaft, a latch plate pivotably attached to the pivot shaft, the latch tongue at a first end of the latch plate, and the release lever at a second end of the latch plate, the latch plate biased by a biasing member that urges rotation of the latch plate about the pivot shaft in a direction that biases the latch tongue into the receiving port in the engaged configuration.



44. The portable tank of claim 43, wherein the latch assembly further comprises a stop rod for limiting rotation of the latch plate as biased by the biasing member in the disengaged configuration.

45. The portable tank of claim 40, wherein one component for facilitating engagement of the portable tank with the docking station comprises a pair of guide rails adapted to receive a portion of the docking station between the guide rails in the engaged configuration, the guide rails having a flared configuration relative to one another at a forward end of the guide rails to facilitate receipt of the portion of the docking station.

46. The portable tank of claim 45, further comprising a wheel mounted on a shaft between the guide rails, the wheel positioned to contact an underside of the portion of the docking station adapted to be received between the guide rails.

47. The portable tank of claim 46, wherein the wheel positioned to contact with the underside of docking station is adapted to receive at least a portion of a resultant downward force transmitted by the docking station in the engaged configuration.

48. The portable tank of claim 40, wherein one component for facilitating engagement of the portable tank with the docking station comprises a flange defining a funnel-like passageway leading to the first portion of the coupling for facilitating mating the second portion of the coupling to the first portion.

49. A system for detachably coupling a mixer drive to a mixer in a portable tank, the system comprising:

a portable tank having a mixer mounted inside the tank and a pair of guide rails for facilitating engagement of the portable tank with a docking station, the mixer comprising a magnetic coupling having a first portion attached to a shaft for driving the mixer, the pair of guide rails having a configuration relative to one another at a forward end of the guide rails to facilitate receipt of an extension of the docking station;

a docking station adapted to receive the portable tank in an engaged configuration and to have no connection to the portable tank in a disengaged configuration, the docking station comprising a mixer drive having a second portion of the magnetic coupling for mating with the first portion, a linkage for converting engagement motion transmitted by the tank in a first direction into engagement motion of the coupling second portion in a second direction, and the extension adapted to be received between the portable tank guide rails; and

a latch mechanism for preventing relative motion between the portable tank and the docking station with the system in the engaged configuration, the docking station comprising a first portion of the latch mechanism, the portable tank comprising a second portion of the latch mechanism for mating with the first portion, and the latch mechanism comprising a release mechanism for disengaging the latch mechanism.